



[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. FAA-2011-1280; Special Conditions No. 25-452-SC]

Special Conditions: Gulfstream Aerospace Corporation, Model GVI Airplane; Windshield Coating in Lieu of Wipers

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: This special condition is issued for the Gulfstream Aerospace Corporation Model GVI airplane. This airplane will have a novel or unusual design feature(s) associated with the use of a hydrophobic windshield coating, rather than windshield wipers, as the means to maintain a clear portion of the windshield during precipitation conditions, as required by the airworthiness standards for transport category airplanes. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: The effective date of these special conditions is November 14, 2011. We must receive your comments by **[insert a date 45 days after date of publication in the Federal Register]**.

ADDRESSES: Send comments identified by docket number FAA-2011-1280 using any of the following methods:

- Federal eRegulations Portal: Go to <http://www.regulations.gov/> and follow the online instructions for sending your comments electronically.

- Mail: Send comments to Docket Operations, M-30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue, SE, Room W12-140, West Building Ground Floor, Washington, D.C., 20590-0001.
- Hand Delivery or Courier: Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, D.C., between 8 a.m. and 5 p.m., Monday through Friday, except federal holidays.
- Fax: Fax comments to Docket Operations at 202-493-2251.

Privacy: The FAA will post all comments it receives, without change, to <http://www.regulations.gov/>, including any personal information the commenter provides. Using the search function of the docket web site, anyone can find and read the electronic form of all comments received into any FAA docket, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the Federal Register published on April 11, 2000 (65 FR 19477-19478), as well as at <http://DocketsInfo.dot.gov/>.

Docket: Background documents or comments received may be read at <http://www.regulations.gov/> at any time. Follow the online instructions for accessing the docket or go to the Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, D.C., between 9 a.m. and 5 p.m., Monday through Friday, except federal holidays.

FOR FURTHER INFORMATION CONTACT: Paul Bernado, Airplane and Flight Crew Interface Branch, ANM-111, Transport Airplane Directorate, Aircraft Certification Service,

1601 Lind Avenue SW., Renton, Washington 98057-3356; telephone (425) 227-1209; facsimile (425) 227-1320.

SUPPLEMENTARY INFORMATION:

The FAA has determined that notice of, and opportunity for prior public comment on, these special conditions are impracticable because these procedures would significantly delay issuance of the design approval and thus delivery of the affected aircraft. In addition, the substance of these special conditions has been subject to the public comment process in several prior instances with no substantive comments received. The FAA therefore finds that good cause exists for making these special conditions effective upon issuance.

Comments Invited

We invite interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data. We ask that you send us two copies of written comments.

We will file in the docket all comments we receive, as well as a report summarizing each substantive public contact with FAA personnel about these special conditions. You can inspect the docket before and after the comment closing date. If you wish to review the docket in person, go to the address in the ADDRESSES section of this preamble between 7:30 a.m. and 4:00 p.m., Monday through Friday, except federal holidays.

We will consider all comments we receive by the closing date for comments. We will consider comments filed late if it is possible to do so without incurring expense or delay. We may change these special conditions based on the comments we receive.

If you want us to acknowledge receipt of your comments on these special conditions, include with your comments a self-addressed, stamped postcard on which you have written the docket number. We will stamp the date on the postcard and mail it back to you.

Background

On March 29, 2005, Gulfstream Aerospace Corporation (GAC) applied for an FAA type certificate for its new Model GVI passenger airplane (hereafter referred to as “the GVI” airplane). On September 28, 2006, GAC re-applied for the GVI type certificate in order to adhere to the application effectivity established by Title 14, Code of Federal Regulations (14 CFR) 21.17(c), and on July 31, 2011, GAC requested an extension of application in accordance with § 21.17(d)(2). The FAA concurred with this request and established a new effective application date of September 18, 2007. The GVI airplane will be an all-new, two-engine jet transport airplane. The maximum takeoff weight will be 99,600 pounds, with a maximum passenger count of 19 passengers.

Type Certification Basis

Under the provisions of 14 CFR 21.17, GAC must show that the GVI meets the applicable provisions of 14 CFR part 25, as amended by Amendments 25-1 through 25-120, 25-122, 25-124, and 25-132 thereto. If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 25) do not contain adequate or appropriate safety standards for the

GVI because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same novel or unusual design features, the special conditions would also apply to the other model.

In addition to complying with the applicable airworthiness regulations and special conditions, the GVI must comply with the fuel vent and exhaust emission requirements of 14 CFR part 34 and the noise certification requirements of 14 CFR part 36. The FAA must also issue a finding of regulatory adequacy pursuant to section 611 of Public Law 92-574, the “Noise Control Act of 1972.”

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type certification basis under § 21.17(a)(2).

Novel or Unusual Design Features

The GVI flightdeck design incorporates a hydrophobic windshield coating to provide adequate pilot compartment view in the presence of precipitation. Sole reliance on such a coating, without windshield wipers or a windshield blower, constitutes a novel or unusual design feature for which the applicable airworthiness regulations do not contain adequate or appropriate safety standards. Therefore, special conditions are required that provide the level of safety equivalent to that established by the regulations.

Discussion

Section 25.773(b)(1) of 14 CFR requires a means to maintain a clear portion of the windshield for both pilots to have a sufficiently extensive view along the flight path during precipitation conditions. The regulations require this means to maintain such an area during precipitation in heavy rain at speeds up to $1.5 V_{SR1}$. The existing regulations cover technologies that primarily account for increased airflow and precipitation rates as limiting conditions. For example, as airflow and precipitation rates increase, the effectiveness of windshield wipers to maintain an area of clear vision normally degrades as airflow and precipitation rates increase. It is assumed that because high speeds and high precipitation rates represent limiting conditions for windshield wipers, they will also be effective at lower speeds and precipitation levels. Accordingly, Sec. 25.773(b)(1)(i) does not require maintenance of a clear area of forward vision at lower speeds or lower precipitation rates. A forced air stream blown over the windshield has also been used to maintain an area of clear vision in precipitation. The limiting conditions for this technology are comparable to those for windshield wipers. Accordingly, introduction of this technology did not require special conditions to maintain the level of safety embodied in the existing regulations.

However, the heavy rain and high-speed conditions specified in the current rule do not necessarily represent the limiting conditions for hydrophobic windshield coatings, which may depend to some degree on airflow over the windscreen to maintain a clear vision area. For example, in low-speed flight or during surface operations, airflow over the windshield may not be adequate to maintain a sufficiently clear area of the windshield. Additionally, during such

critical times as during final approach where the airplane is at a higher-than-normal pitch attitude, airflow over the windshield may be disturbed. In these cases, areas of airflow disturbance or separation on the windshield could cause failure to maintain a clear vision area on the windshield.

In addition to airflow, the effectiveness of hydrophobic coatings may also be affected by the size of precipitation. In some cases, the properties of the coating may not be sufficient to provide a clear area of vision during precipitation in the form of light mist.

The heavy rain and high-speed conditions specified in the current rule do not necessarily represent the limiting condition for this new technology. For example, airflow over the windshield, which may be necessary to remove moisture from the windshield, may not be adequate to maintain a sufficiently clear area of the windshield in low-speed flight or during surface operations. Alternatively, airflow over the windshield may be disturbed during such critical times as the approach to land, where the airplane is at a higher-than-normal pitch attitude. In these cases, areas of airflow disturbance or separation on the windshield could cause failure to maintain a clear-vision area on the windshield.

In summary, the current regulations identify speed and precipitation rate requirements that represent limiting conditions for windshield wipers and blowers, but not for hydrophobic coatings, so it is necessary to issue special conditions to maintain the level of safety represented by the current regulations.

Applicability

As discussed above, these special conditions are applicable to the GVI. Should GAC apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, the special conditions would apply to that model as well.

Conclusion

This action affects only certain novel or unusual design features on the GVI. It is not a rule of general applicability.

The substance of these special conditions has been subjected to the notice and comment period in several prior instances and has been derived without substantive change from those previously issued. It is unlikely that prior public comment would result in a significant change from the substance contained herein. Therefore, because a delay would significantly affect the certification of the airplane, which is imminent, the FAA has determined that prior public notice and comment are unnecessary and impracticable, and good cause exists for adopting these special conditions upon issuance. The FAA is requesting comments to allow interested persons to submit views that may not have been submitted in response to the prior opportunities for comment described above.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for GAC GVI airplanes.

Pilot Compartment View—Hydrophobic Coatings in Lieu of Windshield Wipers

The airplane must have a means to maintain a clear portion of the windshield, during precipitation conditions, enough for both pilots to have a sufficiently extensive view along the ground or flight path in normal taxi and flight attitudes of the airplane. This means must be designed to function, without continuous attention on the part of the crew, in conditions from light misting precipitation to heavy rain at speeds from fully stopped in still air, to $1.5 V_{SR1}$ with lift and drag devices retracted.

Issued in Renton, Washington, on November 14, 2011.

Ali Bahrami
Manager, Transport Airplane Directorate
Aircraft Certification Service